(No Model.)

A. SCHMID.

ELECTRIC RAILWAY MOTOR.

No. 577,071. Patented Feb. 16, 1897.

Fig. 1.

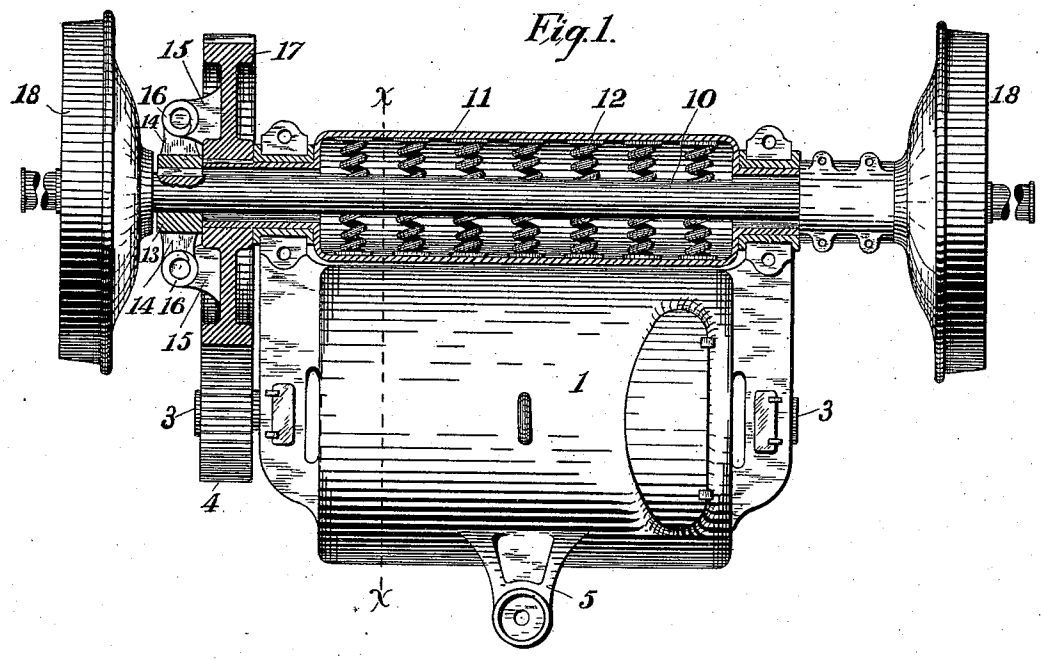


Fig. 2.

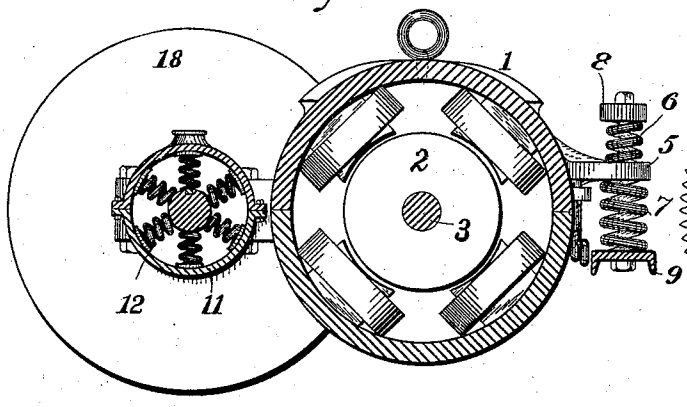
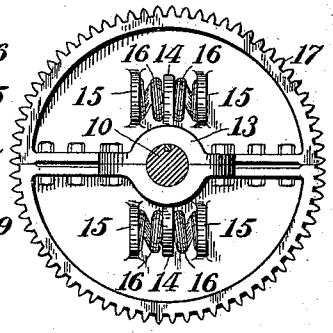


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALBERT SCHMID, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, OF SAME PLACE.

ELECTRIC RAILWAY-MOTOR.

SPECIFICATION forming part of Letters Patent No. 577,071, dated February 16, 1897.

Application filed June 4, 1895. Serial No. 551,658. (No model.)

To all whom it may concern:

Be it known that I, ALBERT SCHMID, a citizen of the United States, residing in Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electric Railway-Motors, (Case No. 645,) of which the following is a specification.

My invention relates to electric motors, and more particularly to such motors as are employed for the propulsion of railway-vehicles.

The object of my invention is to provide a simple, practical, and efficient means whereby all injurious shocks to the car equipment and the tracks may be substantially avoided whatever may be the conditions under which the motors are operated.

It has long been a recognized fact that weight supported unyieldingly upon the axle of a railway-vehicle is the cause of very serious shocks to the track and that such shocks are productive of material injury to the rail-joints and to the car equipment. This serious difficulty has heretofore been partially overcome by supporting the weight of the motor mainly upon springs carried by the body of the car-truck. Such an arrangement results in removing a portion of the weight of the motor from the axle; but the unyielding connection between these parts still remains and results in injurious shocks to the axle and the track, due to the inertia of the motor, the motor being obviously guided in its movements by the axle. In all cases where there is a non-yielding connection between the motor and the axle the motion of the motor, due to any irregularity of the track under one wheel only, results in a dead shock to the axle in a direction perpendicular to the track, since the motor tends to rise at one end and to move downward at the other. This injurious result will always be present so long as the frame of the motor is connected with the axle by two rigid bearings, as has been the universal practice heretofore, even if all of the weight of the motor be otherwise flexibly or yieldingly supported.

In order to overcome the difficulties and objections above indicated, I have devised the means illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a car-axle and its supporting-wheels and an electric motor connected therewith, a portion of the apparatus being shown in section. Fig. 2 is a vertical section, taken on the line *x x* of Fig. 1, looking toward the right. Fig. 3 is a side elevation of a portion of the gear, the axle with which it is connected being shown in section.

Referring now in detail to the drawings, 1 is the frame of the motor, constituting a casing made in two parts hinged together, as is usual, and constituting an inclosing casing for the armature and commutator.

2 is the armature, the shaft 3 of which extends outside the casing at one end and carries a pinion 4.

The parts thus far described are of the usual construction. The motor-frame is provided on one side with a casting or lug 5, with which it is connected with the truck-frame by two springs 6 and 7, one above and the other below the said part 5, the portions of the truck-frame with which these springs engage being shown at 8 and 9.

10 is the car-axle, connecting and supported by the wheels 18 in the usual manner. Surrounding the axle 10 is a hollow shaft or tube 11, preferably constructed of cast-steel and having an internal diameter at its ends somewhat larger than the external diameter of the axle and having a still greater diameter between its end or bearing portions. Interposed between the larger portion of the shaft or tube 11 and the axle are springs 12, of any suitable form and material, but preferably of steel, coiled, as shown, and suitably connected at their outer ends to the said hollow shaft. The number and size of these springs will depend upon the weight of the motor to be supported, but a considerable number will preferably be employed in every instance. Rigidly keyed to one end of the hollow shaft 11 is a gear-wheel 17, which meshes with the pinion 4 on the armature-shaft of the motor. Adjacent to gear-wheel 17 and rigidly keyed to the axle 10 is a collar 13, provided on opposite sides with lugs 14. The gear-wheel 17 is provided with lugs 15 on the side adjacent to the collar 13, and springs 16 are interposed between the lugs 14 and the lugs 16, the whole form-

ing a flexible resilient coupling between the axle and the hollow shaft 11. The motor-frame at the side opposite the lug 5 is sleeved upon the ends of the hollow shaft 11.

While I prefer a yielding resilient connection between the motor-armature and the axle substantially like that above described, I desire it to be understood that different connecting means may be employed which will be within the scope of my invention. For example, the inner ends of the springs 12 may be fastened to the axle and these springs be thus made to serve as the sole connecting means between the axle and the hollow shaft.

It will be readily understood from the foregoing description that the shaft 11 and axle 10 will rotate together as a single part, but that the springs 12 and 16 will permit such independent movement of these parts within small limits as will preclude any injurious shocks such as result from a rigid connection between the motor-frame and the axle.

By means of my invention, as set forth, approximately one half of the weight of the motor is spring-supported from the truck-frame at one side and the other half of the weight is spring-supported from the axle.

While I have illustrated and described a specific combination of parts as constituting my invention, I desire it to be understood that it is not limited to details of construction, as such details may be considerably varied without departing from the spirit and scope of the invention.

I claim as my invention—

1. The combination with a car-axle and a motor supported at one side by said axle, of a plurality of springs circumferentially arranged around said axle and bearing against the same, a bearing for said motor interposed between the same and the outer ends of said springs and gearing between the motor-armature, the bearing and the axle, whereby all of said parts rotate together.

2. The combination with a vehicle-axle and a hollow shaft or tube surrounding the same, of springs interposed between said parts and located above, below and at the sides of the axle, a gear-wheel keyed to said shaft, a coupling between said gear-wheel and the axle, whereby the said parts and the interposed springs rotate together, and an electric motor the field-magnet frame of which is provided with bearings for said hollow shaft and the armature of which has a pinion meshing with said gear-wheel.

3. The combination with a vehicle-axle and a hollow shaft surrounding the same, of a plurality of coiled springs interposed between the axle and shaft and located above, below and at the sides of the axle, an electric motor supported at one side by said shaft, and at its other side by a spring connection with the truck-frame, gearing between the motor-armature and the hollow shaft and a yielding connection between said shaft and the axle whereby the said parts may have a slight movement independent of each other but rotate together.

4. The combination with a vehicle-axle and a hollow shaft surrounding the same, of a plurality of springs disposed between the axle and the shaft, a gear-wheel keyed to said shaft and provided with laterally-projecting lugs, a collar keyed to the axle and provided with lugs, springs interposed between said lugs and the lugs on the gear-wheel and an electric motor having a field-magnet sleeved at one side upon the hollow shaft and spring-supported from the truck-frame at its opposite side and having a pinion on its armature-shaft which meshes with the gear-wheel carried by the hollow shaft.

In testimony whereof I have hereunto subscribed my name this 28th day of May, A. D. 1895.

ALBERT SCHMID.

Witnesses:
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H. C. TENER.